REMARKS

Claims 1, 3-6, 10, 11, 13-15 and 19-33 have been cancelled and new claims 34-39 have been added so that claims 2, 7-9, 12, 16-18 and 34-39 are now in the application. Applicant's new claims 34-39 read upon elected Group II and elected Specie I.

Claims 2, 8, 9, 12 and 16-18 were rejected under 35 USC 103(a) as being unpatentable over Brug. Claims 2 and 12 have been amended to stand in independent form. Claim 2 is distinguished over Brug by reciting:

> a longitudinal biasing stack (LBS) magnetically coupled to the free layer for biasing a magnetic moment of the free layer parallel to the ABS and parallel to major planes of the layers;
>
> the LBS including:
>
> a hard bias layer; and
>
> a nonmagnetic metal spacer layer located between and interfacing the free layer and the hard bias layer."

This structure is shown in Figs. 20 and 32 wherein the nonmagnetic metal spacer layer 402 is located between and interfaces the free layer 220 and the hard bias layer 400. The in-stack longitudinal bias has an advantage of improving the sensor's permeability as stated in lines 5 and 6 of page 4 of Applicants' specification. In support of his rejection the Examiner states:

> "With regard to claims 2 and 12, however, Brug et al. (US 5,930,087) remains silent with respect to a nonmagnetic metal spacer layer being located between and interfacing the free layer and the hard bias layer.
>
> Official notice is taken that nonmagnetic metal spacer layers located between and interfacing free layers and hard bias layers of GMR sensors of the type disclosed by Brug et al. (US 5,930,087) are notoriously old and well known and ubiquitous in the art; such Officially noticed fact being capable of instant and unquestionable demonstration as being well-known.
>
> It would have been obvious to one of ordinary skill in the art at the time the invention was made to provide a nonmagnetic metal spacer layer located between and interfacing the free layer and the hard bias layer of Brug et al. (US 5,930,087), as is known in the GMR art.
>
> The rationale is as follows: one of ordinary skill in the art would have been motivated to provide a nonmagnetic metal spacer layer located between and interfacing the free layer and the hard bias layer of Brug et al. (US 5,930,087), as is known in the GMR art in order to minimize diffusion of the materials of the free layer and hard biasing layer into each other, by providing a metallic buffer layer between the materials, as is well known, established and appreciated in the art."

The Applicants respectfully disagree with the Examiner that one skilled in the art would provide a nonmagnetic metal spacer layer between and interfacing the free layer 30 and the hard bias layers 42 and 44 in Fig. 2 of Brug. In regard to components 42 and 44, Brug states in column 4, lines 42-50 as follows:

> "In one embodiment, the stabilization regions 42 and 44 are realized by layers of antiferromagnetic material. The antiferromagnetic material may be a manganese-based material such as iron-manganese (FeMn), nickel-manganese (NiMn), or iridium-manganese. Alternatively, the antiferromagnetic material may be nickel-oxide or terbium-iron (TbFe).
>
> In other embodiments, the stabilization regions 42 and 44 are realized by permanent magnets."

It is not understood how components 42 and 44 stabilize the magnetic moment M1 of the free layer 30 since magnetic flux will not flow between such components when such components are composed of an AFM material as taught by Brug. However, if the components 42 and 44 are permanent magnets, as optionally disclosed by Brug, magnetic flux lines extend between components 42 and 44 to stabilize the magnetic moment M1 of the free layer 30. If a nonmagnetic metal spacer layer is located between and interfaces each of the stabilizing layers 42 and 44 and a respective side edge of the free layer 30, this will render the stabilization of the magnetic moment M1 of the free layer 30 inoperable since the nonmagnetic metal spacer layers prevent the conduction of flux therebetween. Accordingly, the Applicants respectfully submit that the Brug teaching does not anticipate Applicants' claim 2. Claim 12, which cites similar limitations as claim 2, is considered to be patentable over Brug for the same reasons as given in support for claim 2. Claims 8 and 9, which are dependent upon claim 2, and claims 16-18, which are dependent upon claim 12, are considered to be patentable over Brug for the same reasons as given in support for their parent claims.

Claim 7, which was rejected under 35 USC 102(b) as being unpatentable over Brug, is

considered to be patentable over Brug for the same reasons as given for claim 2.

New claim 34, which is dependent upon claim 2, is further distinguished over Brug by reciting:

> "each of the free layer, hard bias layer and spacer layer having top and bottom large surfaces which are bounded by front and rear surfaces and first and second side surfaces wherein the front surfaces form a portion of the ABS and each of the top and bottom large surfaces has a larger surface area than each of the front and rear surfaces and each of the first and second side surfaces and is perpendicular thereto; and
> each of the top and bottom large surfaces of the spacer layer interfacing a respective large surface area of the free layer and the hard bias layer."

This structure is again shown in Figs. 20 and 32 and is specifically distinguished over Brug which interfaces his hard magnets 42 and 44 with side surfaces of the free layer 30 as shown in Fig. 2 of Brug. Claim 35, which is dependent upon claim 2, is further distinguished over Brug by reciting:

> the read sensor having a sensor stripe height and the flux guide having a flux guide stripe height; and
> dielectric layers electrically insulating some of the layers of the read head along the flux guide stripe height except along the sensor stripe height."

This structure is shown in Fig. 20 wherein the dielectric layers (Al_2O_3) electrically insulate the layers except for the layers located in the sensor stripe height. This is as a result of Applicants' unique method of construction described from page 9, line 26 to page 11, line 4. Claim 36, which is dependent upon claim 35, is further distinguished over Brug for the same reasons as given in support for claim 34. New claim 37, which is dependent upon claim 12, is further distinguished over Brug for the same reasons as given in support for claim 34. Claim 38, which is dependent upon claim 12, is further distinguished over Brug for the same reasons as given in support for claim 35. Claim 39, which is dependent upon claim 38, is further distinguished over Brug for the same reasons as given in support for claim 37.

Should the Examiner have any questions regarding this document he is respectfully requested to contact the undersigned.

Respectfully submitted,

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